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Attorney's Docket No. 3580-011343

AMENDMENT TRANSMITTAL LETTER

Commissioner for Patents  
Washington, D.C. 20231

Serial No.: 09/929,696 Filing Date: August 14, 2001  
Examiner: Not Yet Assigned Group Art Unit: 3723  
Invention: Abrasive Polishing Composition

Transmitted herewith is an Supplemental Preliminary Amendment in the above-identified application.

- ☒ No additional fee is required.  
☒ Substitute Specification included  
☒ Substitute Specification w/ revision marks included

	No of Claims After Amendment	Highest No. Previously Paid For	Present Extra	Small Entity Rate	Non-Small Entity Rate	Charge
Total	<u>8</u>	<u>20</u>	<u>0</u>	x \$ 9.00	x \$ 18.00	\$
Indep.	<u>2</u>	<u>3</u>	<u>0</u>	x \$ 42.00	x \$ 84.00	\$
First Presentation of Multiple Dependent Claim/s				+ \$140.00	+ \$280.00	\$
TOTAL ADDITIONAL FEE						\$

- ☐ A check in the amount of \$\_\_\_\_\_ is enclosed to cover the filing fee.  
☐ A check in the amount of \$\_\_\_\_\_ is enclosed for a \_\_\_\_\_ month Petition for Extension of Time.  
☒ The Commissioner is hereby authorized to charge payment of the following fees associated with this communication to Deposit Account No. 23-0650. Please refund any overpayment to Deposit Account No. 23-0650. An original and two copies of this sheet are enclosed.  
☒ Any additional filing fees required under 37 CFR 1.16.  
☒ Any patent application processing fees under 37 CFR 1.17.

January 31, 2002  
Date

By

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Nancy Eash

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Signature

Date

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Applicant(s) James R. Gilmore et al.

Serial No. 09/929,696

Paper dated January 31, 2002

Atty's File No. 3580-011343

Amount of Checks \$ 0.00

Initials JGP/nle

In re patent application entitled  
"Abrasive Polishing Composition"

Amendment Transmittal Letter  
(1p. in trip); Supplemental  
Preliminary Amendment (2 pp.);  
Replacement Specification (34 pp.);  
Marked-up Specification (38 pp.)



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**PATENT APPLICATION**  
Serial No. 09/929,696  
Attorney Docket No. 3580-011343

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of :  
**James R. GILMORE et al.** : **ABRASIVE POLISHING**  
Serial No. 09/929,696 : **COMPOSITION**  
Filed August 14, 2001 :

Pittsburgh, Pennsylvania  
January 31, 2002

Commissioner for Patents  
Washington, D.C. 20231

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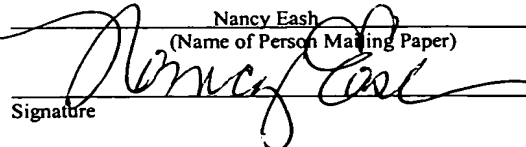
**SUPPLEMENTAL PRELIMINARY AMENDMENT**

Sir:

Prior to initial examination, Applicants hereby submit a second substitute specification. Two specifications are enclosed, one with revisions marks showing the changes made, and a second specification wherein the changes have been incorporated. Please note that paragraph numbers and paragraph indentation have been added to, while line numbering has been eliminated from, the original specification and revision marks were not used to highlight these changes.

The changes made in the second substitute specification are to correct spelling and grammatical inaccuracies. No new matter has been added in this second substitute specification.

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The claims and the abstract have not been changed and, therefore, have not been included in the substitute specification.

Examination and allowance of claims 20-22 are respectfully requested.

Respectfully submitted,

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## ABRASIVE POLISHING COMPOSITION RELATED APPLICATIONS

[0001] This application is a divisional of U.S. Patent application, Serial No. 09/376,892 filed August 18, 1999 which is a continuation in part of U.S. Patent application, Serial No. 09/139,642 filed August 26, 1998, now abandoned.

### FIELD OF THE INVENTION

[0002] The present invention relates to apparatus and methods for performing abrasive work on a work piece using an abrasive visco-elastic medium and, in particular, apparatus and methods that impart a relative cyclic motion between the work piece and the medium to provide a separation between the medium and work piece during each cycle which separation is occupied by a fluid having a viscosity less than that of the visco-elastic medium and where the deformation of the medium is between 50 and 99%.

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### BACKGROUND

#### TECHNICAL FIELD

[0003] The present invention relates to the technical field of machining and particularly to the field of non-traditional machining processes and equipment employing the techniques of and compositions for abrasive flow machining, grinding, deburring, radiussing, leveling and polishing of work pieces. Such processes are typically employed in the working of castings, forged parts, machined parts, and the like. Most often metal parts and the like. The present invention particularly relates to such operations where the flow is attained by relative motion, preferably orbital motion, between the work piece and the abrasive medium.

### PRIOR ART

[0004] Abrasive flow machining has gained wide acceptance for a number of applications as the machining and finishing technique of choice. Such techniques are particularly adapted, for example, to working interior passages in work pieces, for light grinding, deburring, radiussing leveling and polishing of complex surfaces, and particularly three-dimensioned surfaces where surface detail requires working, and in repetitive working of multiple work pieces of complex form and shape.

[0005] In its simplest form, abrasive flow machining requires passing a visco-elastic medium containing an abrasive across the surfaces to be worked. The visco-elastic medium

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